Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

SUCCESS STORY

NEW RECHARGEABLE BATTERY PACKS AND RECHARGER PROVIDE CONTINUOUS OPERATING CAPABILITIES TO THE WARFIGHTER

AFRL designed and built rechargeable, state-of-the-art lithium battery packs and a universal recharger for Air Force Special Operations Command (AFSOC) small unmanned air vehicles (UAV) in less than 4 months. These packs reduce the annual operating cost of batteries for AFSOC's Pointer and Raven UAVs by nearly two orders of magnitude (~1/70 of the current cost). These new packs will last for hundreds of cycles and their associated rechargers will last for thousands of cycles, dramatically increasing system field life. These rechargeable packs provide the Air Force a tremendous savings in operational cost and logistics, along with greater flexibility to recharge the packs in remote locations worldwide.

Air Force Research Laboratory
Wright-Patterson AFB OH

Accomplishment

In response to battery pack issues that surfaced in Operation ENDURING FREEDOM and Operation IRAQI FREEDOM, AFRL teamed with Colorado Power Systems to refine initial rechargeable battery development for AFSOC's Pointer UAV. The rechargeable battery packs, in conjunction with the recharging unit, provide a substantial increase in operational utility and solve major logistical challenges for small UAV operation in harsh locations worldwide. The packs have passed flight testing, and multiple vendors are commercially producing them. The associated battery pack recharger has also passed rigorous field testing and provides a first-ever, worldwide recharging capability.

The initial development achieved a breakthrough in field deployment and the Pointer UAV's resupply problems. This development increased the number of systems that the rechargeable battery packs can support. The battery pack technology commercially benefits the Pointer and Raven UAVs, and it now extends to other, non-UAV equipment as well. The system of two battery packs and one recharger will provide continuous operating capability to a warfighter's system.

Background

The problem related to battery packs became a critical issue as the war in Iraq began. The nonrechargeable lithium-sulfur dioxide battery packs were present in a wide variety of military equipment, mostly in the form of the BA-5590 battery pack. When production capabilities peaked, critical shortages occurred. The response to this potential problem was to develop an alternative source for the Pointer UAV.

The latest development increased the battery packs' energy by 10%, which translates to a nearly 20% increase in the Pointer's on-station time. Commercial technology is continually improving the energy storage capability of the battery cells while maintaining the original battery cell size and shape. As the commercial sector improves the technology, the improved cells will directly increase warfighting capabilities with essentially no additional cost to the government.

Munitions
Support to the Warfighter

Additional Information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (MN-S-05-12)